

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended): A method of manufacturing granular magnetic recording media, comprising sequential steps of:

(a) providing a non-magnetic substrate including a surface;

(b) forming a layer stack on said surface of said substrate, said layer stack including an outermost granular magnetic recording layer with an exposed nano-scale rough and porous surface, said outermost granular magnetic recording layer is formed by sputter deposition in an atmosphere with at least one reactive gas comprising oxygen, nitrogen, and/or carbon atoms;

(c) treating said exposed nano-rough and porous surface of said granular magnetic recording layer to provide at least one of:

(i) a reduction of said nano-scale roughness and porosity;

(ii) increased compositional homogeneity;

(iii) increased microstructural homogeneity;

(iv) preferential removal of at least one element; and

(v) increased grain boundary coverage by a subsequently deposited protective overcoat layer; and

(d) forming a protective overcoat layer on the treated surface of said granular magnetic recording layer.

2. (Original): The method according to claim 1, wherein:

step (b) comprises forming a layer stack including an outermost granular perpendicular magnetic recording layer.

3. (Original): The method according to claim 1, wherein:
step (b) comprises forming a layer stack including an outermost granular longitudinal magnetic recording layer.
4. (Original): The method according to claim 1, wherein:
step (c) comprises etching said surface of said granular magnetic recording layer.
5. (Original): The method according to claim 4, wherein:
step (c) comprises sputter etching said surface.
6. (Original): The method according to claim 5, wherein:
step (c) comprises sputter etching said surface with ions of an inert gas.
7. (Original): The method according to claim 6, wherein:
step (c) comprises sputter etching said surface with Ar ions.
8. (Original): The method according to claim 1, wherein:
step (d) comprises forming a carbon (C)-containing protective overcoat layer.
9. (Original): The method according to claim 8, wherein:
step (d) comprises forming a diamond-like carbon (DLC) protective overcoat layer.

10. (Original): The method according to claim 9, wherein:
step (d) comprises forming said DLC protective overcoat layer by ion beam deposition (IBD).

11. (Original): The method according to claim 1, wherein:
step (a) comprises providing a non-magnetic substrate comprised of a non-magnetic material selected from the group consisting of: Al, NiP-plated Al, Al-Mg alloys, other Al-based alloys, other non-magnetic metals, other non-magnetic alloys, glass, ceramics, polymers, glass-ceramics, and composites and/or laminates of the aforementioned materials.

12. (Original): The method according to claim 1, wherein:
step (b) comprises forming a layer stack including a granular Co-based alloy magnetic recording layer comprised of a CoPtX alloy, where X = at least one element or material selected from the group consisting of: Cr, Ta, B, Mo, V, Nb, W, Zr, Re, Ru, Cu, Ag, Hf, Ir, Y, O, Si, Ti, N, P, Ni, SiO₂, SiO, Si₃N₄, Al₂O₃, AlN, TiO, TiO₂, TiO_x, TiN, TiC, Ta₂O₅, NiO, and CoO, and wherein Co-containing magnetic grains are segregated by grain boundaries comprising at least one of oxides, nitrides, and carbides.

13. (Original) The method according to claim 1, further comprising a step of:
(e) forming a lubricant topcoat layer on said protective overcoat layer.

14. (Original): The method according to claim 13, wherein:
step (e) comprises forming a layer of a perfluoropolyether material.

Claims 15-25. (Canceled)

26. (Currently Amended): A method of manufacturing granular magnetic recording media, comprising sequential steps of:

- (a) providing a non-magnetic substrate including a surface;
- (b) forming a layer stack on said surface of said substrate, said layer stack including an outermost granular magnetic recording layer with an exposed nano-scale rough and porous surface, said outermost granular magnetic recording layer is formed by sputter deposition in an atmosphere with at least one reactive gas comprising oxygen, nitrogen, and/or carbon atoms; and
- (c) etching said nano-rough and porous surface of said granular magnetic recording layer.

27. (Previously presented): The method according to claim 26, wherein:
step (c) comprises sputter etching said surface.

28. (Previously presented): The method according to claim 27, wherein:
step (c) comprises sputter etching said surface with ions of an inert gas.

29. (Previously presented): The method according to claim 26, wherein:
step (b) comprises forming a layer stack including an outermost granular perpendicular magnetic recording layer.

30. (Previously presented): The method according to claim 26, wherein:

step (b) comprises forming a layer stack including an outermost granular longitudinal magnetic recording layer.

31. (Previously presented): The method according to claim 26, wherein:

said granular magnetic recording layer comprises a CoPtX alloy, where X is at least one element or material selected from the group consisting of: Cr, Ta, B, Mo, V, Nb, W, Zr, Re, Ru, Cu, Ag, Hf, Ir, Y, O, Si, Ti, N, P, Ni, SiO₂, SiO, Si₃N₄, Al₂O₃, AlN, TiO, TiO₂, TiO_x, TiN, TiC, Ta₂O₅, NiO, and CoO, and wherein Co-containing magnetic grains are segregated by grain boundaries comprising at least one of oxides, nitrides, and carbides.

32. (Currently Amended): A method of manufacturing granular magnetic recording media, comprising sequential steps of:

(a) providing a non-magnetic substrate including a surface;

(b) forming a layer stack on said surface of said substrate, said layer stack including an outermost granular magnetic recording layer with an exposed nano-scale rough and porous surface, said outermost granular magnetic recording layer is formed by sputter deposition in an atmosphere with at least one reactive gas comprising oxygen, nitrogen, and/or carbon atoms;

(c) sputter etching said surface of said granular magnetic recording layer with ions of an inert gas; and

(d) forming a protective overcoat layer on the treated surface of said granular magnetic recording layer.

33. (Previously presented): The method according to claim 32, wherein:
step (d) comprises forming a diamond-like carbon (DLC) protective overcoat layer.

34. (Previously presented): The method according to claim 32, wherein:
step (d) comprises forming said DLC protective overcoat layer by ion beam deposition (IBD).

35. (Previously presented): The method according to claim 32, wherein:
step (b) comprises forming a layer stack including an outermost granular perpendicular magnetic recording layer.

36. (Previously presented): The method according to claim 32, wherein:
step (b) comprises forming a layer stack including an outermost granular longitudinal magnetic recording layer.

37. (Previously presented) The method according to claim 1, wherein the nano-scale roughness is less than 2.0 Å.

38. (Previously presented): The method according to claim 37, wherein the nano-scale roughness is less than 1.5 Å.

39. (Previously presented): The method according to claim 26, wherein the nano-scale roughness is less than 2.0 Å.

40. (Previously presented): The method according to claim 39, wherein the nano-scale roughness is less than 1.5 Å.

41. (Previously presented): The method according to claim 32, wherein the nano-scale roughness is less than 2.0 Å.

42. (Previously presented): The method according to claim 41, wherein the nano-scale roughness is less than 1.5 Å.